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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/678,296	10/03/2000	Toru Koizumi	35.C14851	5740

5514 7590 04/07/2004

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EXAMINER

AGGARWAL, YOGESH K

ART UNIT	PAPER NUMBER
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2615

DATE MAILED: 04/07/2004

10

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/678,296

Applicant(s)

KOIZUMI, TORU

Examiner

Yogesh K Aggarwal

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) 2,4-6,12,14,15,18,20-22,29 and 30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,7-11,13,16,17,19 and 23-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 October 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 6.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Election/Restrictions

a) Applicant's election without traverse of Claims 1, 3, 7-11, 13, 16, 17, 19, 23-28 in Paper No. 9 is acknowledged. The claims 2, 4-6, 12, 14, 15, 18, 20-22, 29 and 30 have been withdrawn from consideration.

b) Applicant's arguments regarding the definition of the species set up in the first Office action have been persuasive so the new species are drawn as follows:

First Species: figures 1-5, 13, 15

Second Species: figures 6-7, 13

Third Species: figure 8, 13

Fourth Species: figure 9, 13

Fifth Species: figure 10, 13

Sixth Species: figure 11, 13

Seventh Species: figures 12-13

Information Disclosure Statement

1. The information disclosure statement filed 03/20/2001 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because the list of the references is missing. It has been placed in the application file, but the information referred to therein has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609 ¶ C (1).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 3, 7-11, 13, 16, 17, 19, 23-28 are rejected under 35 U.S.C. 102(a) and (e) as being anticipated by Merrill (US Patent # 5,892,541).

[Claim 1]

A method for driving a solid image pickup device provided with pixels, each of the pixels comprising a photoelectric conversion part (figure 3: 122 and figures 2,5: Cell C1) and output means (figure 3: 126, 128) for outputting a signal from the photoelectric conversion part (col. 7 lines 20-27), which method comprises the steps of:
dividing photo-electric charges accumulated in the photoelectric conversion part during one unit of accumulation period (col. 6 lines 56-62, figures 2,3,4A-4E, See also Abstract)[Each cell 110 is read n times during each integration period means that not all the charges accumulated on the cell are read but are first divided and then read. Furthermore as disclosed in col. 8 lines 51-54 the unit 112 stores the first and second charge values collected during one accumulation period in separate locations which is only possible if the charges are divided, read and then individually stored]; and

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reading out the photo-electric charges via the output means (col. 7 lines 20-27 figure 3: 126, 128)[The row-select voltage V_{subRS1} applied through transistor 128 reads charges accumulated on the photoelectric conversion part 122 through the buffer transistor 126 and the row-select RS transistor 128 both of which constitute the output means].

[Claim 3]

The method for driving a solid image pickup device according to claim 1, wherein the output signals obtained by the division and the readout are individually retained (col. 8 lines 51-54) and a horizontal scan is carried out after adding the output signals or while adding the output signals (col. 9 lines 30-36).

[Claim 7]

The method for driving a solid image pickup device according to claim 1, comprising:

a primary readout step (figure 4E: V_{subRS1} at time t_3)[Col. 5 lines 39-45, disclose that the integration cycle starts with resetting the Cell 110 to an initial voltage and then at time t_3 the primary or first readout of the charges take place as disclosed in col. 6 lines 3-13], of reading out a part of the photo-electric charges accumulated in the photoelectric conversion part (figure 2,5: Cell C1) to the charge-voltage conversion part (figure 3: 126) of the output means (figure 3: 126, 128) so that the photoelectric conversion part is not completely depleted (col. 7 lines 52-55)[The first readout for cell C1 takes place at time T_3].

a reset step (figure 4A, 4B: t_6 and t_7), of resetting the charge-voltage conversion part (figure 3: 126) after the primary readout step (col. 7 lines 59-67)[At times t_6 and t_7 the cell C1 is reset after an integration time of 10Ms]; and

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a final readout step (figure 4E: t8), of reading out residual photo-electric charges accumulated in the photoelectric conversion part to the charge-voltage conversion part (figure 3: 126) so that the photoelectric conversion part is completely depleted after the reset step (col. 8 lines 13-17).

[Claim 8]

The method for driving a solid image pickup device according to claim 1, comprising:

a first reset step (figure 4A, 4B: V_{subRR1} and V_{subCR1} at time t1), of performing a reset by applying a reset voltage to the charge-voltage conversion part (figure 3: 126) of the output means so that the photoelectric conversion part is not completely depleted by one-time transfer operation [col. 5 lines 39-48 disclose that the integration cycle starts with resetting the Cell 110 to an initial voltage and this reset voltage is also applied to the charge-voltage conversion part after which the readout takes place at time t3 which means that the photoelectric conversion part is not completely depleted of charges by one-time transfer operation as claimed];

a primary readout step (figure 4E: V_{subRS1} at time t3), of reading out a part of the photo-electric charges accumulated in the photoelectric conversion part (figure 2, 5: Cell C1) to the charge-voltage conversion part (col. 7 lines 52-55)[The first readout for cell C1 takes place at time T3];

a second reset step (figure 4A, 4B: t6 and t7), of resetting the charge-voltage conversion part (figure 3: 126) after the primary readout step (col. 7 lines 59-67)[At times t6 and t7 the cell C1 is reset after an integration time of 10Ms]; and

a final readout step (figure 4E: t8), of reading out residual photo-electric charges accumulated in the photoelectric conversion part to the charge-voltage conversion part (figure 3: 126) after the second reset step (col. 8 lines 13-17).

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[Claim 9]

The method for driving a solid image pickup device according to claim 1, wherein the output means comprises:

a semiconductor diffusion region (figure 7: 232, 234, 236, col. 11 lines 62-67);

a transistor for amplifying voltage signals (figure 2: DC1-DCm) generated in the semiconductor diffusion region (col. 6 lines 20-25);

a transfer gate (figure 3: 126) for transferring a photo-electric charges from the photoelectric conversion part to the semiconductor diffusion region (col. 2 lines 3-7); and

a reset switch (figure 3: RR and CR) for applying a predetermined reset voltage to the semiconductor diffusion region to perform a reset (col. 2 lines 13-17).

[Claim 10]

The method for driving a solid image pickup device according to claim 1, wherein the output means comprises:

a charge-voltage conversion part (figure 3: 126) for converting charges from the photoelectric conversion part into voltage signals (col. 5 lines 29-34)[A buffer transistor can be used as a reset transistor] ;

signal amplification means (figure 2: DC1-DCm) for amplifying the voltage signals generated in the charge-voltage conversion part (col. 6 lines 20-25);

charge transfer means (figure 3: 126 or figure 2: 16) for transferring photo-electric charges from the photoelectric conversion part to the charge-voltage conversion part (col. 2 lines 3-7); and

reset means (figure 3: RR and CR) for applying a predetermined reset voltage to the charge-voltage conversion part to perform a reset (col. 2 lines 13-17).

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[Claim 11]

A method for driving a solid image pickup device comprising a photoelectric conversion part (figure 3: 122 or figures 2, 5: cell C1), a charge-voltage conversion part (figure 3: 126) for converting electric charges from the photoelectric conversion part into voltage signals, amplification means (figure 2: DC1-DCm) for amplifying the voltage signals generated in the charge voltage conversion part (col. 6 lines 20-25), charge transfer means (figure 3: node Nsub IM 1) for transferring photo-electric charges from the photoelectric conversion part to the charge-voltage conversion part (col. 5 lines 29-34) , and reset means (figure 3: RR and CR) for applying a predetermined reset voltage to the charge-voltage conversion part to perform a reset (col. 2 lines 13-17) ; which method comprises the steps of:

in a readout period (figure 4E: t3 to t4), reading out, from the photoelectric conversion part (figure 3: 122 or figures 2, 5: cell C1), photo-electric charges accumulated in the photoelectric conversion part during one unit of accumulation period (col. 6 lines 36-43)[t3 to t4 is one integration period during which charges are readout from the photoelectric conversion part C1] ;

and

transferring a part of the photo-electric charges from the photoelectric conversion part to the charge-voltage conversion part (figure 3: 126), and performing a primary readout operation of reading out output signals amplified by the amplification means (figure 2: DC1-DCm) to a signal output line (col. 7 lines 18-32, figure 2: DO1-DOm); and

then resetting (figures 4A, 4B: t6 and t7) the charge-voltage conversion part (col. 7 lines 59-67, figure 3: 126), transferring the rest of the photo-electric charges from the photoelectric conversion part to the charge voltage conversion part, (col. 8 lines 13-22, figure 4E: t8) [At time

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t8, the charges are transferred from the photoelectric conversion part to the second intermediate node Nsubim2 as disclosed in col. 8 lines 18-22 which is the charge voltage conversion part 126] and performing a final readout operation of reading out output signals amplified by the amplification means to the signal output line (col. 9 lines 14-24).

[Claim 13]

Claim 13 corresponds to claim 2. Therefore claim 13 has been analyzed and rejected corresponding to claim 2.

[Claim 16]

The method for driving a solid image pickup device according to claim 11, wherein after the primary readout operation (col. 7 lines 52-55, figure 4E: VsubRS1 at time t3) and before the final readout operation (col. 8 lines 13-17, figure 4E: t8), at least one intermediate readout operation is performed by resetting the charge-voltage conversion part (col. 7 lines 59-67, figures 4A, 4B: t6 and t7), transferring a part of the photo-electric charges from the photoelectric conversion part to the charge-voltage conversion part, and reading out output signals amplified by the amplification means (figure 2: DC1-DCm) to the signal output line (figure 2: DO1-DOm).

[Claims 17, 19, 23-27]

Claims 17,19,23-27 are apparatus claims corresponding to method claims 1,3, 7-11 respectively. Therefore they have been analyzed and rejected based on method claims 1,3,7-11.

[Claim 28/17]

The solid image pickup device according to claim 17, wherein the photoelectric conversion part is an embedded-type photodiode (See figure 8: 230 and 210 form an embedded type photodiode)

[Claim 28/27]

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The solid image pickup device according to claim 27, wherein the photoelectric conversion part is an embedded-type photodiode (See figure 8: 230 and 210 forms an embedded type photodiode).

Conclusion

1. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

i. Bohm et al. (US Patent # 6,606,121).

ii. So et al. (US Patent # 6,556,244).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yogesh K Aggarwal whose telephone number is (703) 305-0346. The examiner can normally be reached on M-F 9:00AM-5: 30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's primary examiner, Vu Le can be reached (703) 308-6613. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4700.

YKA
March 29, 2004


VU LE
PRIMARY EXAMINER